Massimo Felici





- What existing systems will system need to interact or integrate with?
- How robust does system need to be (e.g., redundant hardware in case of a system failure)?
- What and who will connect to or interact with system, and how will they do it?
- What middleware, including the operating system and communications approaches and protocols, will system use?
- What hardware and software will users directly interact with (PCs, network computers, browsers, etc.)?
- How will you monitor the system once deployed?
- How secure does the system need to be (needs a firewall, physically secure hardware, etc.)?

#### Slide 1: When to Use Deployment Diagrams

• They are very handy in showing what is deployed where, so any nontrivial deployment can make good use of them.

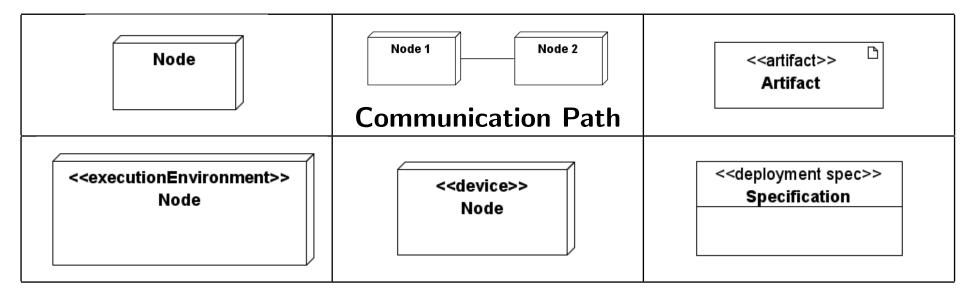


- Show the structure of the run-time system
- Capture the hardware that will be used to implement the system and the links between different items of hardware
- Model physical hardware elements and the communication paths between them
- Plan the architecture of a system
- Document the deployment of software components or nodes

#### Slide 2: Deployment Diagrams

- A Deployment Diagram shows the configuration of run-time processing elements and the software components, processes, and objects
- Software component instances represent run-time manifestations of code units
- Deployment Diagrams capture only components that exist as run-time entities
- A deployment diagram shows the systems hardware, the software installed on that hardware, and the middleware that connects the disparate machines together
- A Deployment Diagram is a collection of one or more deployment diagrams with their associated documentation
- Deployment diagrams show the physical configurations of software and hardware

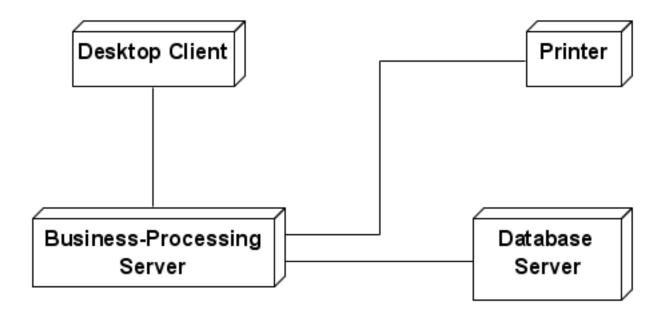






#### **Communication Association**

A communication associations between nodes indicates a communication path between the nodes that allows components on the nodes to communicate with one another





# **Deployment Planning**

- How will your system be installed?
- If different versions of the system will be in production at the same time, how will you resolve differences?
- What physical sites do you need to deploy to and in what order?
- How will you train your users?

#### **Slide 5: Deployment Planning**

- How will your system be installed?
  - Who will install it? How long should it take to install?
  - Where the installation possibly fail? How do you back out if the installation fails? How long does it take to back out?
  - What is your installation window (during what time period can you install your system)?
  - What backups do you need before installation? Do you need to do a data conversion?
  - How do you know that the installation was successful?
- If different versions of the system will be in production at the same time, how will you resolve differences?

### **Slide 5: Deployment Planning**

- What physical sites do you need to deploy to and in what order?
  - How will you train your support and operations staff?
  - Do you need to deploy a production support system so that the support staff uses their own environment to simulate problems?
- How will you train your users?
  - What documentation, and in what formats and languages, do your users, and support and operation staff need?
  - How will updates to documentation be deployed?



# **How to Produce Deployment Diagrams**

- 1. Decide on the purpose of the diagram
- 2. Add nodes to the diagram
- 3. Add communication associations to the diagram
- 4. Add other elements to the diagram, such as components or active objects, if required
- 5. Add dependencies between components and objects, if required

### Slide 6: Allocating Artifacts to Nodes

Consider a number of aspects when allocating components to nodes, e.g.:

- Resource usage
- Geographical location
- Access to devices
- Security
- Performance
- Extensibility and portability

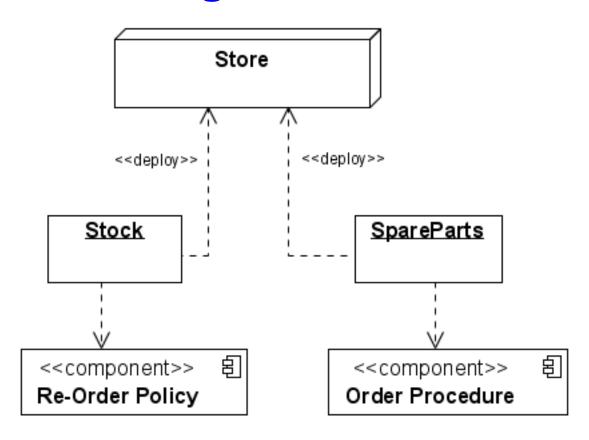


# **Modelling Business Process**

- Business modelling using nodes and components is an effective means of capturing non-computer based processes and entities
- This can be done very early in development, to complement the use case model and other business modelling
- Components are the business procedures and documents; the nodes ("run-time structure") are the organisation units and resources (human and other) of the business



# **Modelling Business Process**





# Readings

#### **Required Readings**

• UML course textbook, Chapter 14 on Deployment Diagrams



# **Summary**

- Deployment Diagrams
  - Rationale
  - Notation
- How to produce Deployment Diagrams